



Energy Security for Enduring Operations



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Confluence of Issues

...And the other is energy. ...It's not just an economical security issue, it's a national security issue.



President Bush, NBC Nightly News, 30AUG06

National Security

"Create good jobs by investing in renewable energy and new technologies for an energy independent America."

Economic Growth



Nancy Pelosi, Press Release, 28 Jun 05

Force Protection

..."reducing the military's dependence on fuel for power generation could reduce the number of road-bound convoys"

Maj. Gen. Richard Zimmer, Defense News, A



Bottom-line

Power Surety

- Saves lives
- Impacts
 - Strategic
 - Operational
 - Tactical
 - Full Spectrum

Contribution

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Power Surety Task Force History



Transportable Hybrid Electric Power Station



Before Spray Foam



After Spray Foam



Iraq



Afghanistan



Kuwait



Ft. Irwin, CA



Feb 08:
PSTF
Transitions
to OSD
Energy
Security
Task Force

Dec 07:
NZ+ JCTD
Approved as Rolling
Start

Oct 07 - Jan 08: Net Zero Structures Constructed at National Training Center, Ft. Irwin, CA

Summer 07:
Demand Reduction in Kuwait, Iraq, Afghanistan, Horn of Africa

Jan 07:
Demand Reduction Demonstration at Ft. Benning

Oct 06:
REF establishes Power Surety

Aug 06: REF Funds THEPS Development

Jul 06: MNE West Renewable



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PSTF Construct

Transparent Demand Reduction



**Supplemental
Alternative/
Renewable
Power**

**Systems
Engineering**

Energy is the New Bandwidth for Commanders

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Outreach

Iraq



National Training Center



Combatant Commands



Commercial Industry and Government Labs



Identifying Operational Needs and Technological Capabilities

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Initiatives

External Spray Foam



Iraq

Enduring Efficient Structure



Ft. Irwin



External Spray Foam



Afghanistan

External Spray Foam



Djibouti

Tactical Hybrid Power



Ft. Irwin

Supplemental Alternative/
Renewable Power



SolarStik



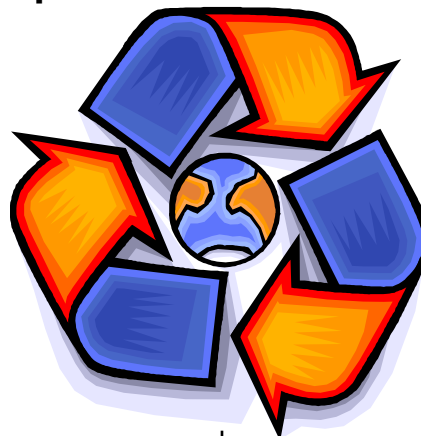
Iraq

Tactical Hybrid Power--
THEPS

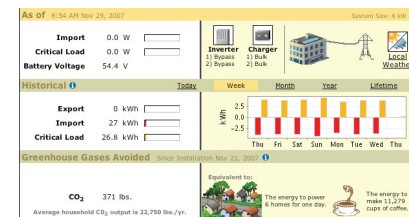


Ft. Irwin

Transparent Demand Reduction



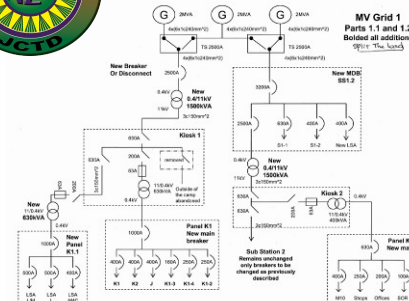
Systems Engineering



Ft. Irwin



Camp Shocker,
Iraq



Camp Slayer,
Iraq

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PSTF Project Involvement



Completed

- **Spray Foam: Eskimo**
- **Transportable Hybrid Electric Power Stations (THEPS)**
- **Net Zero Structures (Monolithic Domes)**
- **Ft. Belvoir Housing Demo**
- **Tactical Garbage to Energy Refinery (TGER)**
- **Tactical Electric**

Current

- **Net Zero Plus JCTD**
 - **Hawaii Housing Demo**
 - **Iraq Home Power Demo**
 - **Solar Powered Security Lights**
 - **Joint Security Station Power (Aztec Survey)**
 - **Defense Energy Fund**
 - **Kuwait Crossing Tactical Hybrid Power Demo**
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Futures

- **NZ+ Installations**
- **Installation Waste to Energy Power Plants**
- **Ft Irwin Housing Demo**
- **OSD Spray Foam Policy Letter**
- **Afghanistan Power Survey**



Fundamentals

- **Fundamentals are not sexy...reduce demand *then...* size supply**
- **Rapid Model (our DNA from REF)**
 - Apply proven commercial strategies (like for-profit companies do...)
 - Demo (sole source)
 - If success, Warfighter buys (competitive)
 - Way ahead: transition to PM ***or...*** catalog (like GSA)/website where unit orders directly + IDIQ contract vehicle in every Unified Cmd (all services)



Demand Reduction Using Spray Foam Insulation

**TRAINING AND
MILITARY EXERCISE
SITES**

**Can be used across the DoD
Spectrum: I&E, Operations,
Training, etc**

**FORWARD
OPERATING
BASES**

INSTALLATIONS

**National Training Center,
Ft. Irwin, CA**

Camp Lemonier, Djibouti



Camp Victory, Iraq

FOB Naray, Afghanistan

Ft. Belvoir, VA

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Current GLOC —

Results: Iraq Forward Operating Base Fuel Savings from Spray Foam

200K JP8
100K DF
12.2K MOGAS

MOSUL

Q-WEST

SPIER

SYRIA

AI ASAD

Ar Ruthah

Ar Ramadi

TQ

350K JP8
25K DF
10K MOGAS

Karbala

An Najaf
As Samawah

CEDAR II

MNF-I initially plans
9M sq ft of Spray
Foam

CENTCOM predicts
50% fuel savings for
power generation--
180K gal/day

- Potential Cost

Avoided @ \$3/gal
fuel: \$540,000/day
@ \$20/gal fuel:

\$3.6M/day

1.0M JP8
250K DF
32K MOGAS

SAUDI
ARABIA

BUEHRIN
G

ALI AL
SALEM

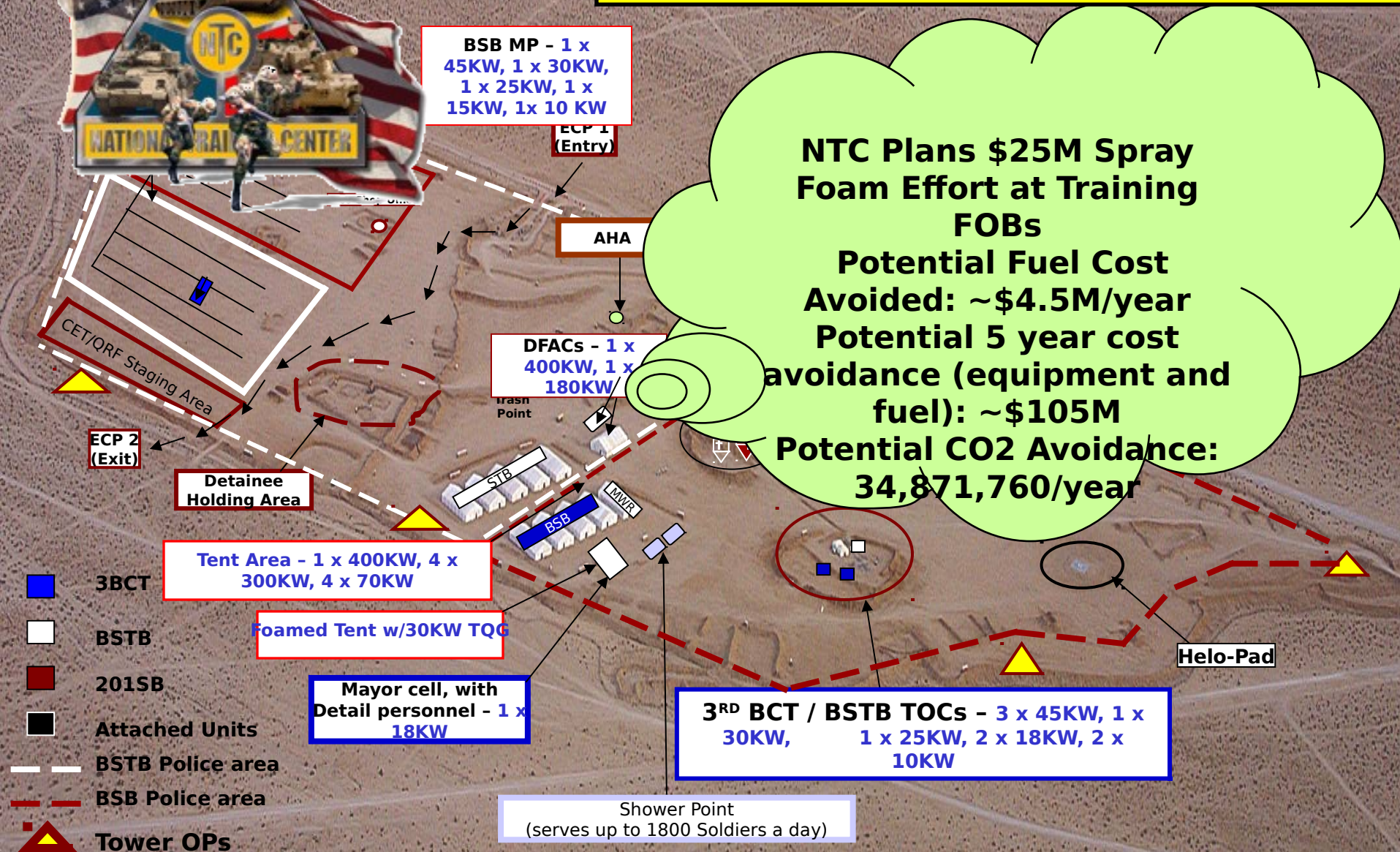
MINA ABDULLAH
TRUCK FILL STAND

KUWAIT

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- 3 GLOCS
- 3 Suppliers
- All Escorted From Border

Results: Expected Savings from NTC FOB Standardization (Spray Foam)

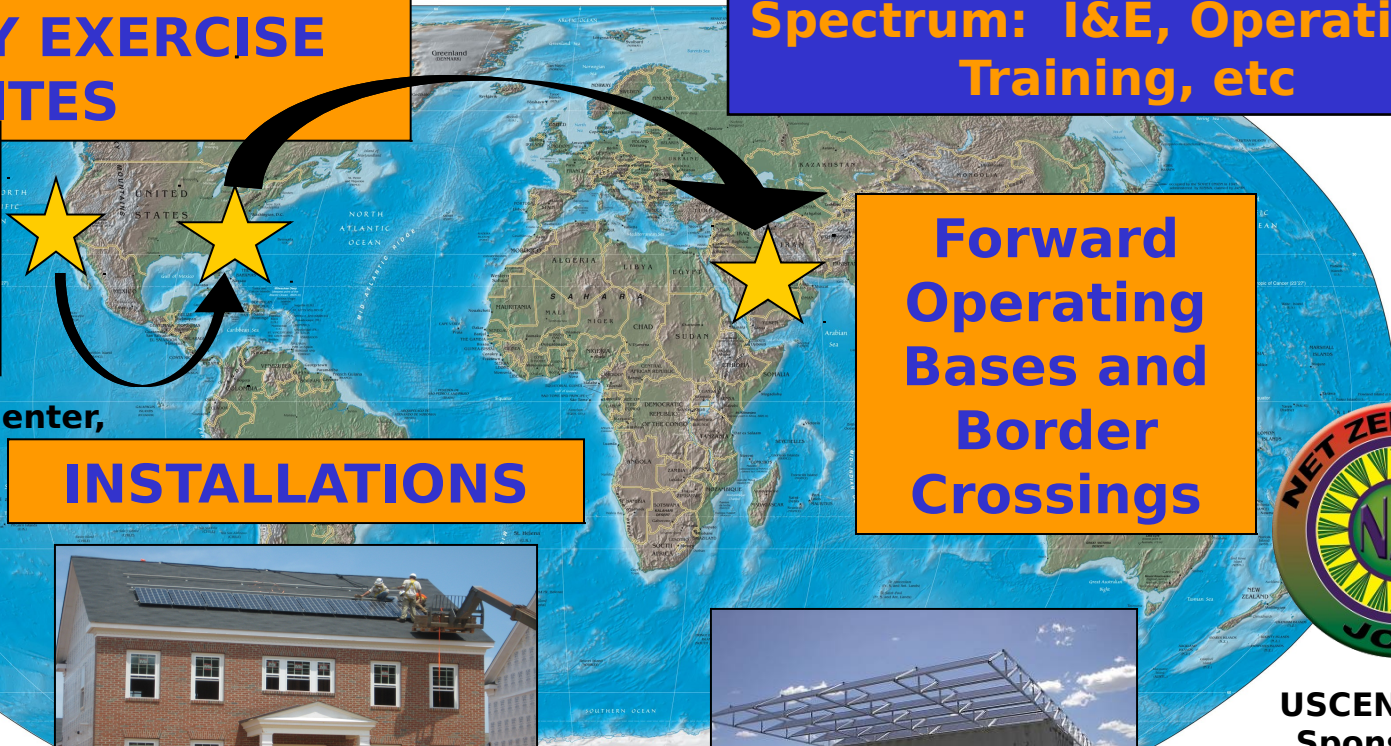




DoD Applications for Net Zero Structures and Sites

**TRAINING AND
MILITARY EXERCISE
SITES**

**Can be used across the DoD
Spectrum: I&E, Operations,
Training, etc**



**Forward
Operating
Bases and
Border
Crossings**



**USCENTCOM
Sponsored
Demonstration
at Ft. Irwin,
CA**

INSTALLATIONS



Ft. Belvoir, VA



K-Crossing, Kuwait

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Estimated Benefits*: Net Zero Homes



Spray-Foam insulation prevents all air infiltration

Control House (Phase I)

Spray Foam Attic (Phase II)

- Assume 30% utility savings
- ~\$2000 up-front cost / home
- Break Even Point in about 5 years

Spray Foam Attic and Walls (Phase III)

- Assume 50% utility savings
- ~\$5500 up-front cost / home
- Break Even Point just over 8 years

Spray Foam Plus Micro Power (Phase III)

- Assume 75% to 100% utility savings
- Energy secure -- capable of operating without

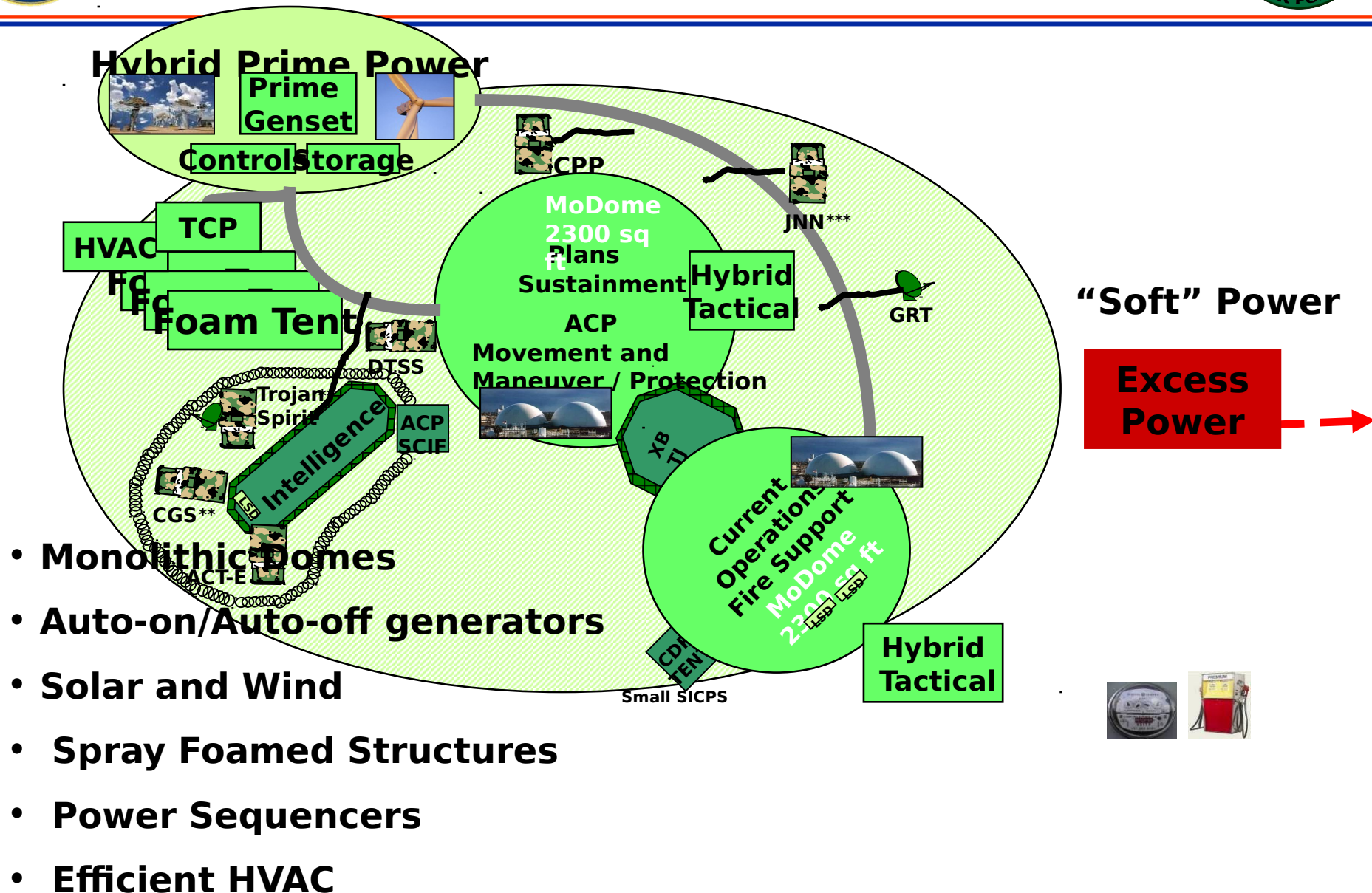


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* Reports forthcoming



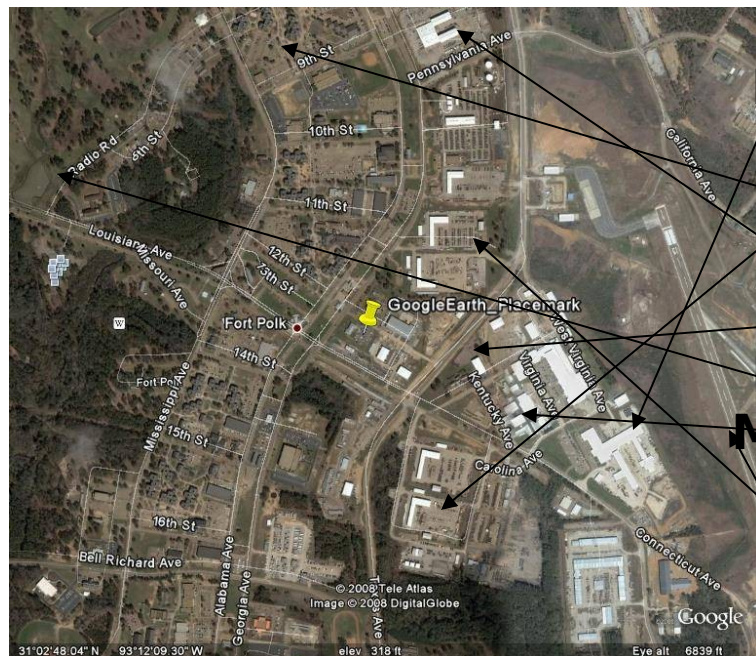
Net Zero Plus Technologies



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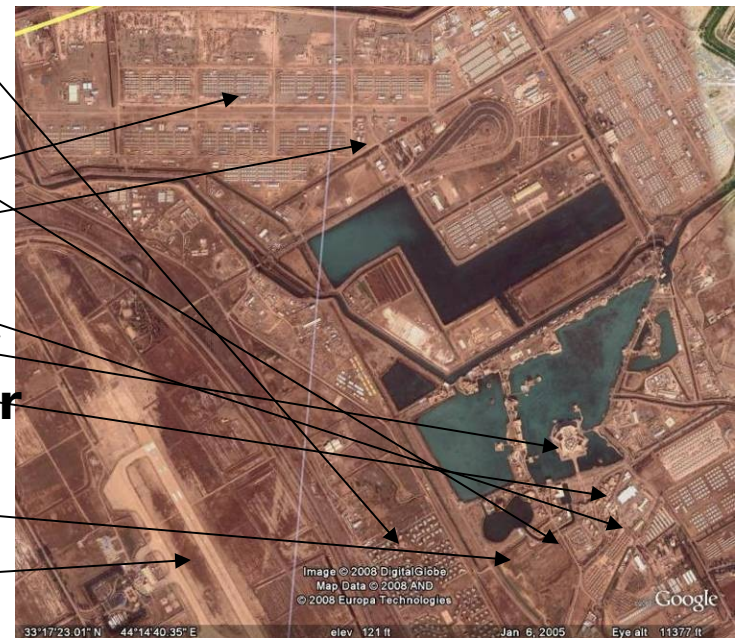


Deployed Installations??



Fort Polk, LA

HQ Buildings
PX
Housing
Mess Hall
Gym
MWR Facility
Movie Theater
SA ranges
Motor Pool
Air Field



Camp Victory, Iraq

...by Leveraging Experience and Expert

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Ft. Irwin Energy Installation of Excellence

- NZ+ Demo—
Completed
- NZ+ JCTD—
Working
- NZ+ Installation—
Great Potential



National Training Center, Ft. Irwin, CA



EUL, UESC or other



External Spray Foam



Net Zero Structure



Ground Source Heat Pump



LED



Tactical Hybrid Power



High Density Foam for



LED Lighting



On-Demand Hot Water



Micro Power/Hybrid Prime Power



Micro Power/Tactical

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The Way Ahead

- Synchronize the Defense Energy Security Strategy
- Vet and prioritize emerging GWOT power requirements
- Reduce Operational Commanders reliance on fossil fuel products and enhance capability
- Holistic approach across entire DoD
- Defense Energy Revenue and Savings Fund
- Literally.....start at home



DoD as an Agent of Change

....By 20XX, the Pentagon will be a NET ZERO PLUS installation.



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